RESTRICTED CIRCULATION

THIS PAPER IS NOT AN OFFICIAL DOCUMENT; IT IS FOR INFORMATION ONLY AND MUST NOT BE QUOTED IN ANY PRINTED PUBLICATION

AGRICULTURAL MEMORANDUM NO 688

Simulation of Febrile Common Cold epidemiology

L P Smith

Using Kew and Speke temperature data over 4 week periods starting 3 days earlier then 4 week periods of disease data (incidence per 100,000) with a notation

I_4 = mean incidence over 4 weeks of febrile common cold

F_4 = infection, the I_4 for the previous period

M = immunity, the mean of I_4 over previous three 4 week periods in excess of 75.

T_a = mean air minima to a maximum of 4^oC

T_b = mean air minima in excess of 4^oC

ΔT = change in mean air minima from previous 4 week period

then

$$\sqrt{I_4} = 0.57 \sqrt{F_4} - 0.28 \sqrt{M} - 0.62 T_a - 0.31 T_b - 0.05 \Delta T + 7.53$$

with a multiple correlation of 0.84

Starting with the 4 weeks ending 18 June 1967, when I_4 = 47 and M = 0 each successive I_4, F_4 and M can then be calculated using T_a, T_b, and ΔT, the meteorological data, with no further subsequent reference to morbidity data. This simulation produces the estimates recorded in the appendix, which have a correlation of 0.79 with the actual disease date.

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Bracknell

December 1974

APPENDIX. Comparison of actual and simulated disease data.

Data Set No	Disease Actual	Disease Est	Data Set No	Disease Actual	Disease Est	Data Set No	Disease Actual	Disease Est	Data Set No	Disease Actual	Disease Est
7	39	38	34	23	35	61	28	38	88	58	42
8	29	32	35	17	32	62	62	54	89	96	66
9	31	35	36	52	41	63	65	68	90	77	89
10	68	41	37	50	49	64	72	100	91	86	130
11	64	61	38	68	93	65	122	106	92	114	104
12	116	94	39	272	144	66	169	110	93	162	86
13	242	136	40	176	146	67	145	125	94	168	100
14	233	123	41	66	142	68	87	114	95	127	86
15	126	118	42	87	128	69	55	79	96	81	84
16	119	99	43	65	102	70	46	67	97	62	62
17	60	79	44	80	59	71	51	57	98	61	53
18	56	62	45	54	36	72	52	58	99	58	45
19	44	50	46	41	35	73	36	46			
20	37	42	47	26	34	74	34	46			
21	33	37	48	22	37	75	70	63			
22	31	36	49	46	43	76	88	77			
23	53	38	50	65	61	77	94	100			
24	78	44	51	75	81	78	169	106			
25	79	78	52	105	108	79	149	119			
26	103	131	53	99	132	80	100	105			
27	119	125	54	103	114	81	82	107			
28	160	155	55	107	112	82	90	102			
29	194	135	56	63	83	83	56	80			
30	81	106	57	58	66	84	59	53			
31	47	61	58	54	53	55	47	38			
32	47	42	59	55	47	86	43	37			
33	44	41	60	34	42	87	34	35			